New Hampshire Broadband Mapping and Planning Program
University of New Hampshire
September, 2010 Data Submission

I. Data Description

In accordance with the effective NTIA guidance for Round 2 data submissions, the New Hampshire Broadband Mapping and Planning Program (NHBMPP) submitted the data set described below and associated documents to NTIA in the fall of 2010.

BB_Map_FGB_NH – FGDC approved file geodatabase containing feature classes for:

Feature Class	Number of Records
BB_ConnectionPoint_LastMile	0
BB_ConnectionPoint_MiddleMile	52
BB_Service_Address	3,305
BB_Service_CAInstitutions	2,178
BB_Service_CensusBlock	60,217
BB_Service_Overview	0
BB_Service_RoadSegment	23,844
BB_Service_Wireless	482
State_Boundary	1

In total, approximately 88,000 individual data records on broadband availability were submitted by New Hampshire. Collectively, these records describe availability as reported by 20 broadband providers in the state. In addition, the NHBMPP submitted data on over 2,100 community anchor institutions.

II. Provider Participation

The NHBMPP has identified 66 broadband providers in the state. As reported above, 20 of these providers actively participated in the program for the fall, 2010 cycle. The status of the remaining 46 providers is as follows:

Provider Status	# of Providers
1. Contact has been made and NDA is in progress.	2
2. Contact has been made, and future participation is anticipated. Delays are largely due to limited provider capacity to prepare data.	8
3. Contact has been made, and discussions are underway regarding provider participation.	11
4. Provider has been identified, but is not yet offering broadband service in New Hampshire.	2
5. Contact has been made, and provider has refused to participate.	1
6. Provider has not responded to multiple attempts to establish contact.	14
7. Provider submitted data that was incomplete/unusable. We anticipate improved participation during next data collection cycle.	8

.III. Data Collection and Integration

A. Primary Data Collection

Data Acquisition

Primary data was collected directly from the service providers. The NHBMPP first developed a set of guidance documents based on NTIA specifications, and distributed those to the individual providers. Once the guidance was disseminated, NHBMPP staff followed up with providers via phone/email to encourage participation and address questions, as required. Typically, multiple communications were required to ensure a complete data submission was received.

Data Pre-Processing

To support the data mapping and integration efforts, the following base data sets were acquired and/or retrieved from the NH GRANIT state GIS clearinghouse archives:

- State and town boundaries (based on 1:24,000 USGS DLG files);
- 2001 Land Cover data set (derived from Landsat TM imagery);
- 2000 TIGER Census Blocks;
- 2009 Census MAF/TIGER Road Segments; and
- 2009 USGS National Elevation Data set (NED).

All required NTIA fields were added to the census block and road segment data sets. In addition, the road segments were processed against the census blocks to populate two fields used internally – the left block ID and the right block ID associated with each road segment.

Data Processing and Integration

The broadband availability data was processed and integrated using a suite of GIS tools and procedures, depending upon the format and content of the data submitted by the individual providers. Generally, the processing involved executing one or more of the following steps:

- Scanning and georeferencing paper maps and using the digital products as a visual reference to select out corresponding features from the project base data sets;
- Geocoding addresses using both an internal locator based on the TIGER road segments, and where required, the ESRI TA_BatchAddress_US subscription service;
- Using standard GIS tools to join spreadsheets to feature classes based on common fields;
- Using GIS “select by attribute” tools to identify census blocks less than (and greater than) 2 square miles;
- Using GIS “select by location” tools to isolate roads adjacent to census blocks;
- Using GIS buffering tools to generate service areas around central office locations; and/or
- Using Cellular Expert ArcGIS extension to generate a prediction surface for wireless providers submitting antenna locations (and associated data).

B. Community Anchor Institutions

Data was submitted for 2,178 Community Anchor Institutions (CAIs) in the state covering the full range of categories established by NTIA, as follows:

Category	Number of CAI's	Percent of Total
1. School – K through 12	308	14.1%
2. Library	482	22.1%
3. Medical/health care	389	17.9%
4. Public safety	458	21.0%
5. University, college, other post-secondary	28	1.3%
6. Other community support – government	477	21.9%
7. Other community support – non governmental	36	1.7%
TOTAL	2,178	100.0%

In addition to the above, partial data was collected for approximately 1,250 CAI's. Because of transfer data model requirements, these records are being temporarily retained until such time as complete information can be collected and/or the submission requirements are modified.

The data collection was largely accomplished by the nine regional planning commissions in New Hampshire, with the NHBMPP staff at the University responsible for developing initial guidance and for compiling the resulting regional data sets into a standardized statewide layer. The primary steps in the data development process included:

- Develop a master list of CAI's by category, relying on statewide lists (schools, libraries, health care facilities), existing GIS data sets (largely from local hazard mitigation plans), and local knowledge;
- Map the location of each CAI, using existing GIS data sets, reference to aerial imagery, web research, and field data collection where necessary;
- Contact each CAI by phone to collect the required broadband information; and
- Verify data (see verification section below).

IV. Validation

A. Primary Data Collection

Feedback/verification was primarily implemented in cases where the provider delivered non-geographic data, e.g. address lists, named road segments/address ranges, lists of census blocks, wireless tower locations. In these cases, the NHBMPP returned maps (.pdf files) to the provider for their review and correction. Where providers delivered addresses or road segments, the product returned was a geographically referenced version of the data that was submitted. For wireless providers who delivered antenna locations and specifications, the program provided maps that displayed the modeled coverage area generated from the Cellular Expert signal propagation modeling software. Very little feedback was received on the review products from the providers.

The NHBMPP initiated a number of additional verification resources and procedures, as described below. While data from each was reviewed for the September, 2010 submission, in most cases the data was partial and was being developed for more significant utilization in subsequent data cycles.

- Speed test – The program has generated a customized speed test on the project web site (iwantbroadbandnh.org). To date, approximately 1800 records have been submitted. The site is presently collecting only speed test information, although within the next month the speed test will be incorporated in a larger effort to collect a full range of broadband access information from visitors to the web site.
- Community forums – The NHBMPP is hosting a series of 15 community broadband forums around the state. These sessions are designed to educate participants about the program, and to collect detailed data from residents, businesses, and institutions on where broadband access is/is not available. Data collection is presently managed via a hardcopy survey form and accompanying maps. The form will soon be replaced (or augmented) by the online version described below.
- Project web site – The project web site is being expanded to include the broadband survey linked to an online mapping interface, thereby yielding a fully-attributed georeferenced data set that can be applied directly to map verification activities.
- Satellite dish survey – The NHBMPP has initiated a drive-by inventory of satellite dishes in rural areas of the state, under the premise that a cluster of buildings with satellite broadband dishes signifies an area with no other broadband options available.

B. Community Anchor Institutions

The CAI data has been subjected to two rounds of verification. An initial round of verification was completed in May, 2010 by re-interviewing a randomly selected subset of CAI contacts (20% of the entities within each of the 7 data categories). In August/September of 2010, a subsequent and comprehensive verification was accomplished by generating a broadband profile sheet for each participating CAI, emailing that to each CAI contact for review, and modifying the CAI record based on any updates returned.